



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,255	11/14/2003	Juha Ylitalo	60091.00265	7951

32294 7590 09/21/2005

SQUIRE, SANDERS & DEMPSEY L.L.P.
14TH FLOOR
8000 TOWERS CRESCENT
TYSONS CORNER, VA 22182

EXAMINER

HUYNH, CHUCK

ART UNIT	PAPER NUMBER
----------	--------------

2683

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,255

Applicant(s)

YLITALO, JUHA

Examiner

Chuck Huynh

Art Unit

2683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 10, 15, 25, 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10 and 25 state a method as claimed in claim 3, wherein a primary common pilot (PCPICH) according to the WCDMA system is transmitted to the radio cell and a separate secondary common pilot (SCPICH) according to the WCDMA system is transmitted to each user-specific beam.

The claim language is indefinite; specifically, there is no disclosure or explanation of a separate secondary common pilot (SCPICH) according to the WCDMA system is transmitted to each user-specific beam within the specification. Appropriate correction is required.

Regarding claim 15 and 30, the claim states a method as claimed in claim 1, wherein the power balance is a perfect power balance.

The claim language is indefinite; specifically, the term "perfect." Examiner suggests that the claim be more specific in limiting the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9, 11, 14, 15-24, 26, 29,30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink et al. (hereinafter Reudink) in view of Oshima et al. (hereinafter Oshima).

Regarding claim 1, 16 and 31, Reudink discloses the method for determining weight factors of antenna beam (as well as the transmitter) (Col 10, lines 50-60; Col 11, lines 19-24), the method comprising:

using at least one directional antenna beam implemented with an antenna array to establish a radio link (Col 5, lines 26-30),

forming a radio cell with the antenna beam (Col 5, lines 35-44) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]),

dividing the radio cell into at least two different cells by dividing the antenna beam (Col 5, lines 55-57; Fig. 8) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]).

Reudink discloses all the particulars of the claim, but is unclear on selecting weight factors of antenna elements of the antenna array such that the antenna element

specific sums of weight factors of a radio cell formed with the antenna array and corresponding weight factors of at least one, second radio cell formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements.

Even though Reudink discloses selecting weights for signals (Col 7, lines 7-19) in consideration for power for multiple beams targeting different sectors (Col 5, lines 3-11), but does not fully disclose the summation of weight factors.

However, Reudink in combination with Oshima does disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of a radio cell formed with the antenna array and corresponding weight factors of at least one, second radio cell formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25; Col 5, lines 53-55).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Oshima's disclosure to provide the summation of weight factors for improving quality (Abstract) and power (Col 6, lines 31-32).

Regarding claims 2, 17 and 32, Reudink discloses a method for determining weight factors of antenna beams (as well as the transmitter) (Col 10, lines 50-60; Col 11, lines 19-24), the method comprising:

using at least one directional antenna beam implemented with an antenna array to establish a radio link (Col 5, lines 26-30),

dividing the antenna beam into at least two user-specific beams (Col 7, lines 20-51)

Although Reudink discloses all the particulars of the claim, Reudink does not fully disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of antenna elements of a user-specific beam and corresponding weight factors of other user-specific beams formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements.

Even though Reudink discloses selecting weights for signals (Col 7, lines 6-19) in consideration for power for multiple user specific beams targeting (Col 5, lines 3-11), but does not fully disclose the summation of weight factors.

However, Reudink in combination with Oshima does disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of antenna elements of a user-specific beam and corresponding weight factors of other user-specific beams formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25; Col 5, lines 53-55).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Oshima's disclosure to provide the summation of weight factors for improving quality (Abstract) and power (Col 6, lines 31-32).

Regarding claims 3, 18 and 33, Reudink discloses a method for determining weight factors of antenna beams (as well as the transmitter) (Col 10, lines 50-60; Col 11, lines 19-24), the method comprising:

using at least one directional antenna beam implemented with an antenna array to establish a radio link (Col 5, lines 26-30),

forming a radio cell with the antenna beam (Col 5, lines 35-44) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]),

dividing the radio cell into at least two different cells by dividing the antenna beam (Col 5, lines 55-57; Fig. 8) (furthermore, this limitation is admitted in Applicant's specification as prior art Page 10, [0052]),

dividing at least one antenna beam forming a radio cell into at least two user-specific beams (Col 7, lines 20-51).

Reudink discloses all the particulars of the claim except selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of corresponding weight factors of beams formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements.

Even though Reudink discloses selecting weights in the same antenna array, for multiple beams can be set as equal in consideration of power (Col 7, lines 7-19; Fig. 1A,B; Col 5, lines 3-11), but does not fully disclose the summation of weight factors.

However, Reudink in combination with Oshima does disclose selecting weight factors of antenna elements of the antenna array such that the antenna element specific sums of weight factors of antenna elements of a user-specific beam and corresponding weight factors of other user-specific beams formed with the same antenna array are at least substantially equal within predetermined limits in order to achieve a predetermined power balance between different antenna elements (Col 7, lines 8-25; Col 5, lines 53-55).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Oshima's disclosure to provide the summation of weight factors for improving quality (Abstract) and power (Col 6, lines 31-32).

Regarding claim 4 and 19, Reudink discloses a method as claimed in claim wherein the desired beam directivity (toward user) is taken into account when predetermined limits are set for the antenna element specific sums (Col 7, lines 32-34, 52-56).

Regarding claim 5 and 20, Reudink discloses a method as claimed in claim 1, wherein the minimization of crosstalk (noise) produced in another cell is taken into

account when predetermined limits are set for the antenna element specific sums (Col 7, lines 34-35).

Regarding claim 6 and 21, Reudink disclose a method as claimed in claim 1, wherein the desired attenuation between different radio cells is taken into account when predetermined limits are set for the antenna element specific sums (Col 7, lines 52-55).

Regarding claim 7 and 22, Reudink discloses a method as claimed in claim 1, wherein the achieving of the necessary capacity in the desired geographical area (coverage area) is taken into account when predetermined limits are set for the antenna element specific sums (Col 5, lines 19-34).

Regarding claim 8 and 23, Reudink discloses a method as claimed in claim 1, wherein the weight factors of the antenna elements of the antenna array are selected by numerical estimation (Col 7, lines 7-19).

Regarding claim 9 and 24, Reudink discloses a method as claimed in claim 1, wherein the weight factors of the antenna elements of the antenna array are selected by analytical examination (Col 7, lines 7-19).

Regarding claim 11 and 26, Reudink discloses a method as claimed in claim 1, wherein the antenna beams are formed by an analogue beam forming method (entire reference).

Regarding claim 14 and 29, Reudink discloses a method as claimed in claim 2, wherein a different scrambling code is used in one or more user-specific beams (individual identification code for each mobile user) (Col 7, lines 45-47).

Regarding claim 15 and 30, Reudink discloses a method as claimed in claim 1, wherein the power balance is a perfect power balance (Col 7, lines 55-56).

3. Claim 12, 13, 27, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink in view of Oshima in further view of Holma et al. (hereinafter Holma).

Regarding claim 12 and 27, Reudink in view of Oshima discloses all the particulars of the claim, but is unclear on a method as claimed in claim 1, wherein the antenna beams are formed by a digital beam forming method.

However, Holma does disclose the antenna beams are formed by a digital beam forming method (Page 1, [0005]; Page 2, [0011]).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Holma's disclosure to provide another form of beam forming method using digital data, signal and technology.

Regarding claim 13 and 28, Reudink in view of Oshima discloses all the particulars of the claim, but is unclear on a method as claimed in claim 1, wherein the weight factors are complex.

However, Holma does disclose the weight factors are complex (Page 2, [0011]; Page 3, [0033]).

It would have been obvious to one ordinarily skilled in the art at the time of invention to incorporate Holma's disclosure to provide a way to calculate complex weight factors and a method of using complex weight factors to improve beam-forming method.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sato; Toshifumi discloses a Base station transmitter/receiver capable of varying composite directivity of antennas

Dent; Paul W. discloses a Multiple access communications system and method using code and time division

(For more refer to Reference Cited Form PTO-892)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Huynh whose telephone number is 571-272-7866. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chuck Huynh



WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600